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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,938	11/13/2003	Joseph D. Rigney	041A.0008.U1(US)	4781
67516 7590 09/24/2007 HARRINGTON & SMITH, PC 4 RESEARCH DRIVE SHELTON, CT 06484-6212			EXAMINER SAVAGE, JASON L	
			ART UNIT 1775	PAPER NUMBER
			MAIL DATE 09/24/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/713,938	<b>Applicant(s)</b> RIGNEY ET AL	
	<b>Examiner</b> Jason L. Savage	<b>Art Unit</b> 1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 28-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>20070720</u> . | 6) <input type="checkbox"/> Other: _____  |

***Claim Objections***

Claims 1 and 7 are objected to because of the following informalities:

In claim 1, line 13, the limitation of less than about 1-3 mils is awkward. The claim has been interpreted as meaning less than about 3 mils.

Claim 7 has the same limitation as recited in claim 1 and has been given the same interpretation. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, lines 2 and 17, the limitation of without a weight penalty is indefinite since it is unclear what is intended by the claim limitation. For purposes of Examination the claim limitation has been treated as meaning the repaired component does not weigh more than the component prior to the repairing method being performed.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-13 and 28-30 are rejected under 35 U.S.C. 103(a) as obvious over Rigney et al. (US 6,153,313) in view of Rosenzweig et al (EP 1 123 987).

Rigney teaches a low growth environmental bond coating which is applied directly to a base metal substrate comprising an alloy having an aluminum content of about 30-60 atomic percent (col. 3, ln. 35-60). Rigney teaches this low growth environmental bond coating interacts to form a diffusion zone with the substrate, however the diffusion zone is limited so that upon subsequent repair of the component, the thickness of the base metal that must be removed will be minimized (col. 5, ln. 33-52). Rigney further teaches that the diffusion zone is preferably less than 0.2 mils (ie 5 micrometers) (col.5, ln. 36-40). Rigney teaches that by using this type of low growth bond coating that the base metal substrate can be refurbished more times than would be possible if a conventional diffusion bond coat were used (col. 5, ln. 50-52).

Rigney does not exemplify a repair process. Rosenzweig teaches a method of repairing a turbine engine component wherein the bond coat is removed from the base metal substrate which also results in the removal of a portion of the base metal substrate causing a reduction in the thickness (par. [0008]). Rosenzweig further teaches that a low growth environmental bond coating is applied which serves to extend the life of the component and repairability of the component (par. [0009-0010]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have applied an improved bond coating such as that taught by Rigney after removing the prior bond coat to refurbish the metal substrate such as is taught by

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Rosenzweig. One would have been motivated to employ the coating of Rigney over the prior bond coat with the expectation that the component could have an increased component life.

Regarding the limitation of the initial reduction of thickness in the substrate component in step b) is limited to between about 1-3 mils in thickness, Rosenzweig teaches that the initial bond coat may grow to a thickness of between 2-3 mils due to consumption of the substrate (par. [0004]). As such, Rosenzweig meets the limitation that when the initial bond coating is removed, the substrate thickness is reduced in thickness in an amount within the claimed range. In the alternative, since Rosenzweig does not explicitly recite the reduction in thickness of the base metal substrate once the coatings are removed, it would have been obvious to one of ordinary skill in the art to have attempted to limit the reduction in substrate thickness to as little as possible which would fall within the range claimed.

Regarding the limitation that the reduction in thickness of the substrate in subsequent repair cycles in step c) will be less than 1-3 mils in thickness, Rigney teaches that diffusion zone growth into the substrate is less than 0.2 mils which would meet the claim limitation (col. 5, ln. 42-50).

Regarding the limitation that 'a lower growth (emphasis added) environment bond coating is applied', Applicant has not defined what constitutes a lower growth coating. Should Applicant intend that the lower growth coating results in a diffusion zone having a decreased depth in comparison to the prior coating which was removed, although the prior art does not teach removing a coating of one material and applying a

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new coating of a different material, it would have been obvious to one of ordinary skill in the art at the time of the invention. One would have been motivated to apply the new bond coat of Rigney after removing a bond coat of a different material in order to have extended the life of the base metal substrate.

The prior art is silent to the limitation that the lower growth bond coat has a density less than density of the prior bond coat and the repaired component does not weigh more than the coated component prior to repairing. It would have been within the purview of one of ordinary skill in the art to have refurbished a metal base substrate having a bond coat of any density including densities greater than the bond coat of Rigney with a reasonable expectation of success.

Regarding claim 2, Rigney meets the claim limitation of no more than 1 mil of the substrate is removed in subsequent repair cycles.

Regarding claim 3, it would have been within the purview of one of ordinary skill in the art to have removed a diffusion bond coating and replaced it with the lower grown environment bond coating of Rigney in order to extend the life of the base metal substrate.

Regarding claims 4, 6 and 8, the integrated aluminum level in the bond coating of Rigney would be within the range claimed by Applicant since the aluminum concentration of the aluminum layer is within the claimed range and the bond coating thickness is approximately 15 micrometers (col. 5, ln. 26-31) which is substantially less than the thicknesses which were employed to achieve the integrated aluminum levels greater than the claimed values.

Regarding claim 5, Rigney teaches that the bond coating is a  $\beta$ -NiAl coating (col. 5, ln. 19-30).

Regarding claim 7 and 9, the coating of Rigney may be a MCrAlY coating wherein M is selected from Ni (col. 7, Table I).

Regarding claim 10, the component from a turbine engine (col. 4, ln. 40-46).

Regarding claims 11-13, although the references are is silent as to refurbishing a used component which previously employed a PtAl diffusion bond coat, Rosenzweig teaches that bond coatings of PtAl diffusion bond coatings are known (par. [0013-0017]). It would have been within the purview of one of ordinary skill in the art to have recognized that the bond coating of Rigney could be employed after removing conventional bond coating materials including PtAl with a reasonable expectation of success.

Regarding claim 28-30, Applicant recites in the specification in the last two paragraphs of page 13 and first paragraph of page 14 that a PtAl diffusion coating may have a density of  $7.9 \text{ g/cm}^3$  and that the bond coat of the invention may be NiAl which may have a density of about  $6.1 \text{ g/cm}^3$ . Since Rigney as modified by Rosenzweig teaches the same materials, one would reasonable expect they would have the same densities and meet the claim limitations. Regarding the integrated aluminum level of the PtAl diffusion coating, one would expect the integrated aluminum level would be within the claimed range since the same composition is taught. Specific claimed alloy, whose compositions are in such close proportions to those in the prior art that, prima facie one skilled in the art would have expected them to have the same properties, must be

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considered to have been obvious from known alloys, Titanium Metals Corporation of America V. Banner, 227 USPQ 773.

### ***Response to Arguments***

Applicant's arguments filed 7-2-07 have been fully considered but they are not persuasive.

Applicant argues that Rigney does not meet the claim limitations since it does not disclose a method for repairing a coated component. Applicant states that Rigney is concerned with the compositional features of the bond coat and are particularly concerns with bond coats a specific composition for increased creep strength. As was recited in the rejection above, although Rigney does not exemplify an embodiment wherein a prior bond coat it is removed in a refurbishment process; Rigney is concerned with refurbishment as it explicitly recites that the inventive coating allows for the base metal substrate to be refurbished more times than would be possible with a prior art diffusion bond coated substrate.

Applicant argues against the combination stating that Rosenzweig teaches a method which applies an elemental to the substrate which prevents any interaction between the base metal substrate and a subsequently applied coating. Applicant concludes that Rosenzweig teaches away from the claimed bond coating that forms a diffusion zone having a reduced thickness. However, it is the coating material and method of Rigney which is being employed in the rejections above. Rosenzweig is merely provided as evidence that the claimed method of removing a prior art bond coat



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by removing the bond coating and a portion of the base metal substrate is known. As such, the assertion that Rosenzweig teaches away from the claimed invention is not persuasive.

Applicant further directs the Examiner's attention to the results described at pages 16-17 of the specification and show in Figure 3 showing the tested NiAl coatings 21 produced less than -.5x coating growth into the base metal as compared to conventional PtAl diffusion coatings. However, Rigney explicitly recites that the NiAl coating has reduced coating growth into the base metal as compared to other conventional diffusion coatings. As such, one would have readily envisioned that employing the NiAl coating of Rigney when refurbishing a base metal substrate would have exhibited minimal coating growth into the substrate.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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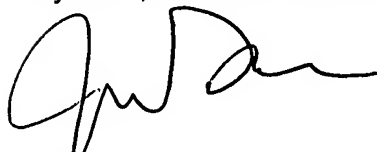
shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Savage whose telephone number is 571-272-1542. The examiner can normally be reached on M-F 6:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Jason Savage  
9-16-07



JENNIFER C. MCNEIL  
SUPERVISORY PATENT EXAMINER

9/17/7